Before the
**FEDERAL COMMUNICATIONS COMMISSION**
Washington, DC 20554

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| In the Matter of | ) | |
| Report to Congress on Microwave Bands | ) | WT Docket No. 12-156 |

To: The Wireless Telecommunications Bureau

# COMMENTS OF COMSEARCH

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July 20, 2012

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## COMMENTS OF COMSEARCH

Comsearch hereby submits its comments on the Public Notice by the Wireless Telecommunications Bureau ("Bureau") on June 20, 2012, in the above-referenced docket.[1]

### I. Introduction And Summary

Comsearch is a leading provider of spectrum management and wireless engineering products and services to the commercial and federal market. Since 1977, Comsearch has been actively engaged with Commission, the National Telecommunications Information Administration, and various industry groups and standards organizations to develop rules, industry recommendations, and standards that promote the efficient use of the radio spectrum. Comsearch has extensive experience providing frequency coordination services for Fixed Service point-to-point microwave systems, point-to-multipoint systems, and satellite earth stations.

[1] *See* Public Notice: Wireless Telecommunications Bureau Seeks Information From The Public For Report To Congress On Microwave Bands, DA 12-972, June 20, 2012 ("Public Notice").

The Public Notice solicits information for use by the Federal Communications Commission ("FCC") in preparing a report to Congress, as required by Section 6412 of the Middle Class Tax Relief and Job Creation Act of 2012 ("Spectrum Act").[2] The report is to address the "rejection rate" for "common carrier" applications for spectrum in the 10,700 - 11,700 MHz ("11 GHz"), 17,700 - 19,700 MHZ ("18 GHz"), and 21,200 - 23,600 MHz ("23 GHz") bands (collectively, "microwave bands") that were not granted "because of the lack of availability of such spectrum or because of interference concerns of existing licenses."[3]

As discussed below, the Commission's report should conclude that the number of rejections of requests for common carrier use of spectrum in the microwave bands at issue is minimal. First, applications for common carrier use of the microwave bands constitute only a small portion of the total number of applications submitted. Second, because applications for point-to-point licenses in the microwave bands are to be submitted only to the FCC and only after the applicant completes frequency coordination procedures to minimize potential interference to other licensees and applicants, the number of applications for licenses in the microwave bands "rejected" by the FCC because of the lack of availability of spectrum or because of interference concerns of existing licenses is essentially zero. Third, even if the Commission were to interpret "applications" more broadly to include requests for coordination submitted by prospective users to third-party coordinators, the "rejection" rate is very, very low. As a leading frequency coordinator in the frequency bands at issue, Comsearch strives to satisfy its clients' requirements for microwave links and is able to do so successfully in almost all instances.

[2] Middle Class Tax Relief and Job Creation Act of 2012, P.L. 112-96, §6412 (2012), 126 Stat 156.

[3] Spectrum Act, §§6412(a), (c) and (d).

## II. FCC Success Story: The Current First Come, First Served Prior Coordination Process Encourages Spectral Efficiency And Makes The Microwave Bands Available To All Entrants

As the Public Notice describes, the Commission has licensed spectrum for microwave uses for much of its history.[4] The FCC's regime of site-by-site licensing of point-to-point microwave links is straightforward and time-tested. The FCC's rules require that, before filing an application to license a microwave link between two points, the prospective user must undertake frequency coordination with potentially affected licensees, permittees, and other applicants with previously filed applications.[5] The basics of this approach have been in place for at least 35 years.[6] Thus, in almost all instances any issues of potential interference are worked out before an FCC application is filed; and the process of resolving interference issues is largely invisible to the FCC.

Specifically, in order to complete frequency coordination, the prospective user must conduct an interference analysis to select a system design that will avoid interference in excess of permissible levels to other users.[7] The interference analysis determines the appropriate channel frequencies and sometimes other parameters such as antennas and power levels for the proposal. The prospective user must then provide prior notice to potentially affected parties

[4] See Allocation of Frequencies in the Bands Above 890 Mc., *Report and Order*, 27 FCC 359 (1959).

[5] *See* 47 C.F.R. §§ 101.21(f), 101.103.

[6] *See* Amendment of the Commission's Rules to Establish a Private Operational-Fixed Microwave Radio Service, *Report and Order*, 33 Radio Reg. 2d 1047 (1975).

[7] *See* 47 C.F.R. § 101.103(d)(1).

through prior coordination notices ("PCNs") that contain the technical details of the proposed operations.[8] The recipients of a PCN are allowed 30 days to respond, although the FCC rules encourage responses to be made as quickly as possible.[9] If no adverse responses are received at the end of the 30-day period, the prospective user may file an application with the FCC and certify that the proposed operations have been frequency coordinated.[10] If the application is for frequency pairs eligible for conditional authorization, the applicant may begin operation immediately after filing the application. [11]

Although an interference analysis is conducted before sending a PCN, in some cases claims of potential interference may be received in response to the PCN due to database discrepancies or differences in predictive software. In such cases, the prospective user may respond in a number of ways to resolve the situation, including upgrading the proposed antenna, reducing power, changing frequency bands, or modifying the proposed paths. The parties are generally very cooperative as it is in their best interest to find solutions that benefit all, as any of the parties could be the next to try to coordinate a new link.

As a result, the Part 101 point-to-point microwave rules successfully support an extensive and growing user community. The current rules are carefully designed to give *all* users fair and equal access to fixed service ("FS") spectrum, both common carrier and non-common carrier.

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[8] 47 C.F.R. § 101.103(d)(2)(ii).

[9] 47 C.F.R. § 101.103(d)(2)(iv).

[10] *See* 47 C.F.R. § 101.21(f).

[11] 47 C.F.R. § 101.31(b)(1)(vii). Conditional authorization allows an applicant to begin operation on a conditional basis as soon as an application that has been successfully coordinated is filed, without waiting for FCC processing of the application. Only certain frequencies are available for conditional authorization.

As a result, thousands of licensees utilize the bands, representing virtually every market segment. The Commission recently recognized that an essential component of many broadband networks – particularly in mobile wireless networks – are the microwave backhaul facilities that are often used to transmit data between cell sites, or between cell sites and network backbones.[12] The Commission further noted that service providers' use of microwave links as a cost-effective alternative to traditional copper circuits and fiber optic links has been increasing.[13] In certain rural and remote locations, microwave is the only practical high-capacity backhaul solution available. In addition to wireline and wireless telecommunications carriers that utilize microwave band links extensively, other users of the microwave bans include critical infrastructure (railroads, gas pipelines, electric companies, etc.), public safety (police, fire, hospitals), large and small enterprises, including financial service companies, broadcast, cable, and State and local governments. Furthermore the 23 GHz band is shared with Federal Government systems.

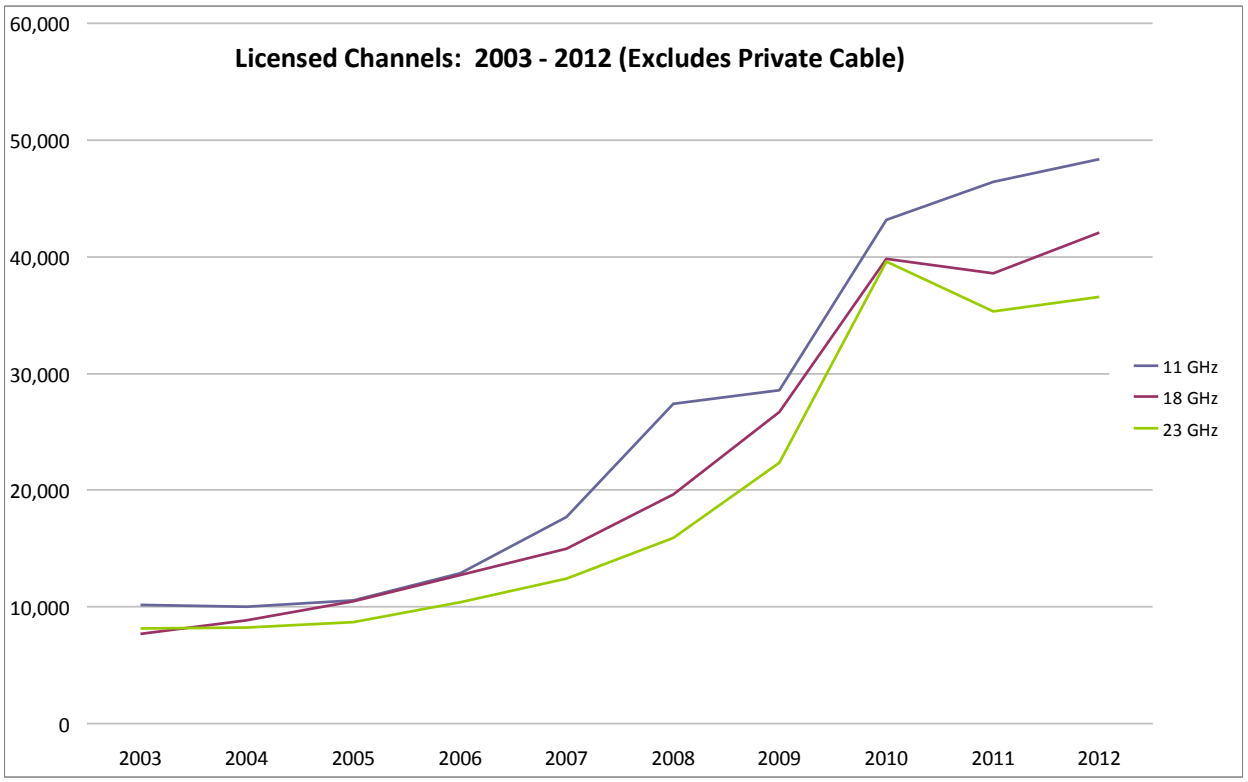
For the microwave bands at issue in this proceeding, there are no gate-keeper licensees with exclusive rights to the spectrum in a given geographic area. The key attribute of the Part 101 rules today is that access to the microwave bands is made available on a first-come first-

[12] Amendment of Part 101 of the Commission's Rules to Facilitate the Use of Microwave for Wireless Backhaul and Other Uses and to Provide Additional Flexibility to Broadcast Auxiliary Service and Operational Fixed Microwave Licensees; Petition for Rulemaking filed by Fixed Wireless Communications Coalition to Amend Part 101 of the Commission's Rules to Authorize 60 and 80 MHz Channels in Certain Bands for Broadband Communications, *Report and Order, Further Notice of Proposed Rulemaking, and Memorandum Opinion and Order*, 26 FCC Rcd 11614, 11617 (2011).

[13] *Id.* In 2005, 8.7 percent of backhaul traffic was sent by fixed wireless. *See* Implementation of Section 6002(b) of the Omnibus Budget Reconciliation Act of 1993, Annual Report and Analysis of Competitive Market Conditions with Respect to Commercial Mobile Services, *Fourteenth Report*, 25 FCC Rcd 11404 (2010) ¶ 294. By 2009, that figure increased to 12.3 percent. *Id.*

served basis, with everyone having an equal opportunity to the bands, which are generally available when and where they are needed.

Diagram 1 below, shows the impressive overall growth in the number of licensed and applied-for channels in the primary point-to-point bands between 11 and 23 GHz between 2003 and 2012. Appendices 1 through 3 depict the number of microwave band paths that are currently licensed in the United States and their geographic locations.




Sharing spectrum for point-to-point service through frequency coordination maximizes re-use for multiple licensees. The Part 101 rules require licensees to control the potential interference to others by using, among other things, the lowest feasible power and highly directional antennas.

Table A below illustrates the ability to re-use channels in the microwave bands even in a crowded market like Los Angeles. This same information also is depicted on maps in Appendices 4 through 6.

| | 11 GHz | 18 GHz | 23 GHz | Total |
|---|---|---|---|---|
| Links | 594 | 1350 | 1204 | 3148 |
| Channels | 1444 | 3373 | 3253 | 8070 |
| Unique Licensees | 53 | 66 | 84 | |
| Highest Re-use per Channel[14] | 56 | 171 | 296 | |

**Table A: Los Angeles Spectrum Usage – 11, 18 and 23 GHz (Comsearch Data, October 2010)**

In Comsearch's opinion, the ready access to microwave channels and the re-use of the channels by multiple licensees under the Part 101 point-to-point rules constitute a real success story of efficient spectrum usage.

## III. The Spectrum Act's Focus On Common Carrier Applications Excludes A Large Portion Of The Market.

The Spectrum Act focuses exclusively, and misguidedly, on "applications" (either to the FCC or a third-party coordinator) for the microwave bands designated as "common carrier."[15] By doing so, the Spectrum Act misses the larger share of the market.

The distinction between "common carrier" and "non-common carrier" Private Operational Fixed-Service ("POFS") operations has eroded over the decades. At one time, common carrier and POFS operations were in different frequency bands and were regulated under different parts of the FCC's rules, Part 21 for common carriers and Part 94 for POFS. The

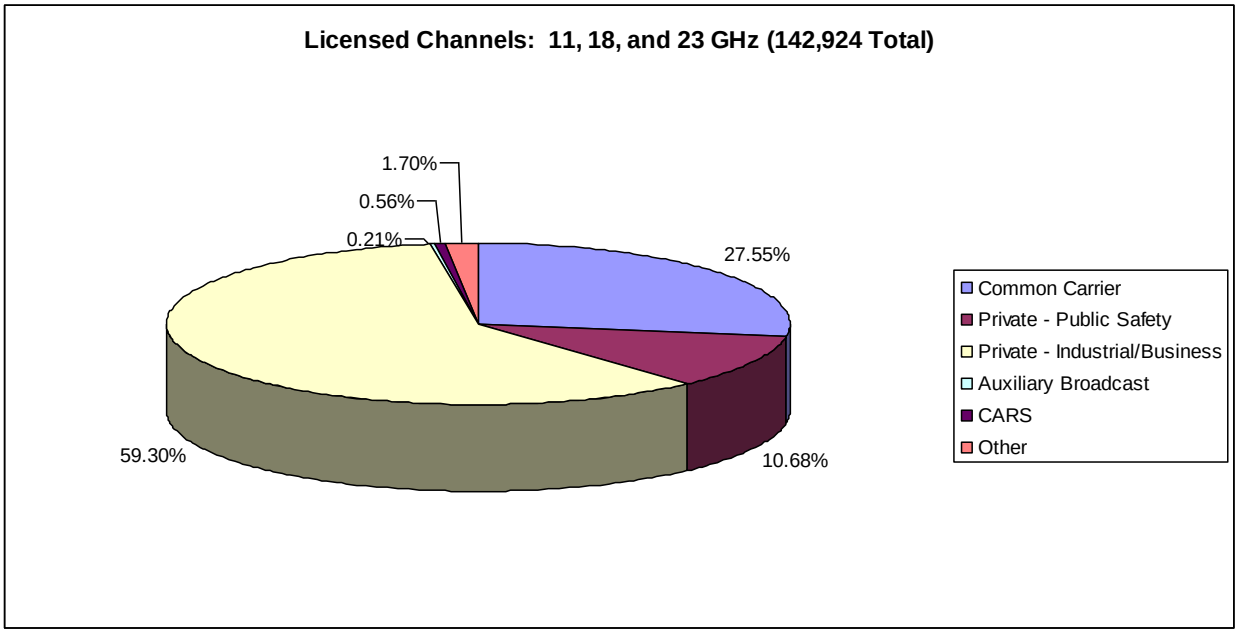
[14] This row indicates the largest number of times any particular nominal channel frequency is used in the area. As the table shows, because higher frequency links are shorter in length, they can be re-used more extensively in a given area than lower frequency links.

[15] As discussed in the following section, applications actually are only filed with the Commission.

lines between the two services have blurred since at least 1985, however, when POFS licensees were allowed to provide communications services to unrelated entities on a for-profit basis.[16] Moreover, common carriers often obtain microwave spectrum for internal use pursuant to POFS licenses. In 1996, the FCC merged the Part 21 and Part 94 rules into a new Part 101 that governed both common carrier and POFS operations and allowed the two services to share many frequencies; and applicants for microwave licenses are allowed to self-designate whether to apply as a common carrier or not. For example, backhaul for commercial wireless networks is often now conducted under POFS microwave licenses. Diagram 2 on the following page indicates that only 27.55% of the licensed channels in the microwave bands are designated common carrier. Thus, the Spectrum Act's focus on common carrier applications does not provide a full picture of the use of the microwave bands. The ability to make use of the bands under common carrier status is heavily influenced by co-equal sharing with links under private

[16] Amendment of Part 94 of the Commission's Rules and Regulations to Authorize Private Carrier Systems in the Private Operational Fixed Microwave Service, *First Report and Order*, 57 Rad. Reg. 1486 (1985).

operational fixed status ("Private" in the figure), the latter being predominant.




The Commission must be careful that its report to Congress does not inadvertently misrepresent the current status of the microwave bands by focusing on common carrier applications and "rejection rate."

## IV. The "Rejection Rate," No Matter How Defined, Is Very Small

The Spectrum Act's use of "rejection rate" is difficult to interpret. The Act defines "rejection rate" as:

> [T]he number and percent of applications (whether made to the Commission or to a third-party coordinator) for common carrier use of spectrum that were not granted because of lack of availability of such spectrum or interference concerns of existing licensees.[17]

Although the Spectrum Act refers to "applications" made either to the FCC or to a third-party coordinator, in fact applications for license are submitted only to the FCC.[18] In contrast,

[17] Spectrum Act § 6412(d).

[18] *See* 47 C.F.R. § 101.1.

the FCC rules define the "prior coordination" process conducted by third-party coordinators as "A bilateral process conducted *prior to filing applications* which includes the distribution of the technical parameters of a proposed radio system to potentially affected parties for their evaluation and timely response."[19] Nearly all interference concerns are resolved in the frequency coordination phase that is required prior to application filing, so, any application that is filed with the FCC is unlikely to be rejected. By the plain language of the Spectrum Act, "applications" are submissions to the FCC on Form 601 that have been prior coordinated in accordance with FCC rules; for these the rejection rate is close to zero.

In the Public Notice, the Bureau deems "any coordination request that ultimately results in a path that satisfies the original communications requirements between points" to be "successfully coordinated."[20] Presumably "rejection" is thus intended to be defined for the purpose of the public notice as the opposite category. Even with this broader interpretation of "applications" to include requests for coordination submitted by prospective users to third-party coordinators, the "rejection" rate is still very low. Requests for frequency coordination from prospective users can come in many forms, from very detailed technical proposals specifying the precise frequencies, locations and equipment sought to more generalized requests simply asking for communications links between two locations. In either case, Comsearch prides itself on finding solutions to its clients' needs through good engineering practices and the incentives and obligations incorporated in the FCC's rules. Although a client's request for a particular link using a specific frequency pair and a specific antenna may not be able to be satisfied, Comsearch will work with the client on potential alternatives, including upgrading the proposed antenna,

[19] 47 C.F.R. § 101.3 (emphasis added). See also 47 C.F.R. § 101.21(f).

[20] Public Notice at 2 n.15.

reducing power, or changing frequency bands. As the Bureau recognizes in the Public Notice, such changes should not be considered "rejections," but only reasonable and necessary adaptations within the prior coordination process.[21] Similarly, it should not be considered a "rejection" when a client initiates the PCN process to explore its options for using microwave spectrum but at some point abandons the process for its own business reasons.[22]

In any event, Comsearch does not keep track of abandoned coordinations or of "rejections," no matter how defined. It has had no business need to do so. The flexible licensing model currently in place virtually always results in users obtaining the connectivity they need. Based upon anecdotal examples, it is estimated that the percentage of links where Comsearch has not been able to find a point-to-point microwave solution when requested is less than one percent.

Nevertheless in those rare situations where it is difficult or impossible to find interference-free frequencies to accommodate a proposal, the following factors are typically involved:

1. Multiple links are aligned near parallel, sharing the same sites or corridors, so antenna performance upgrades cannot resolve interference because of near-zero discrimination angles.
2. There is already a high density of usage and re-use of channels in the band at the proposed sites: a large number of links in various directions using multiple channels.
3. Changing bands is not feasible because the proposed link is too long to operate reliably at a higher frequency.

[21] *Id.*

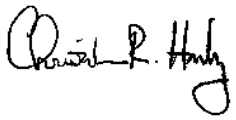
[22] Perhaps the client's communications need has changed or disappeared, or a more cost-effective communications solution is identified.

In such situations of extreme congestion, Comsearch does not believe that any alternate assignment methodology to Part 101 coordination could achieve greater frequency re-use or efficiency.

**Conclusion**

For the foregoing reasons Comsearch urges the Commission to incorporate in its report to Congress the factors described above.

Respectfully submitted,



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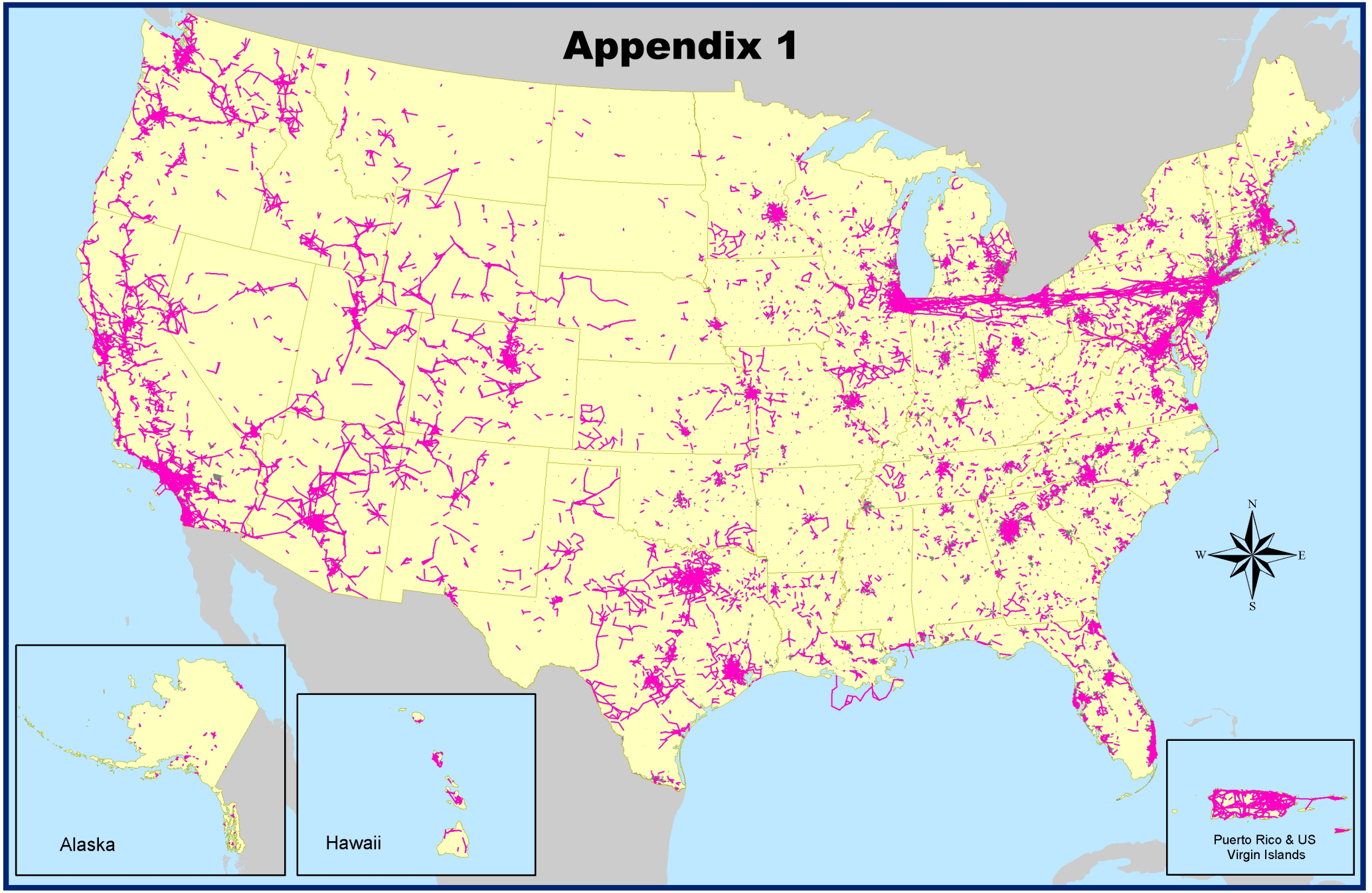
# Appendix 1

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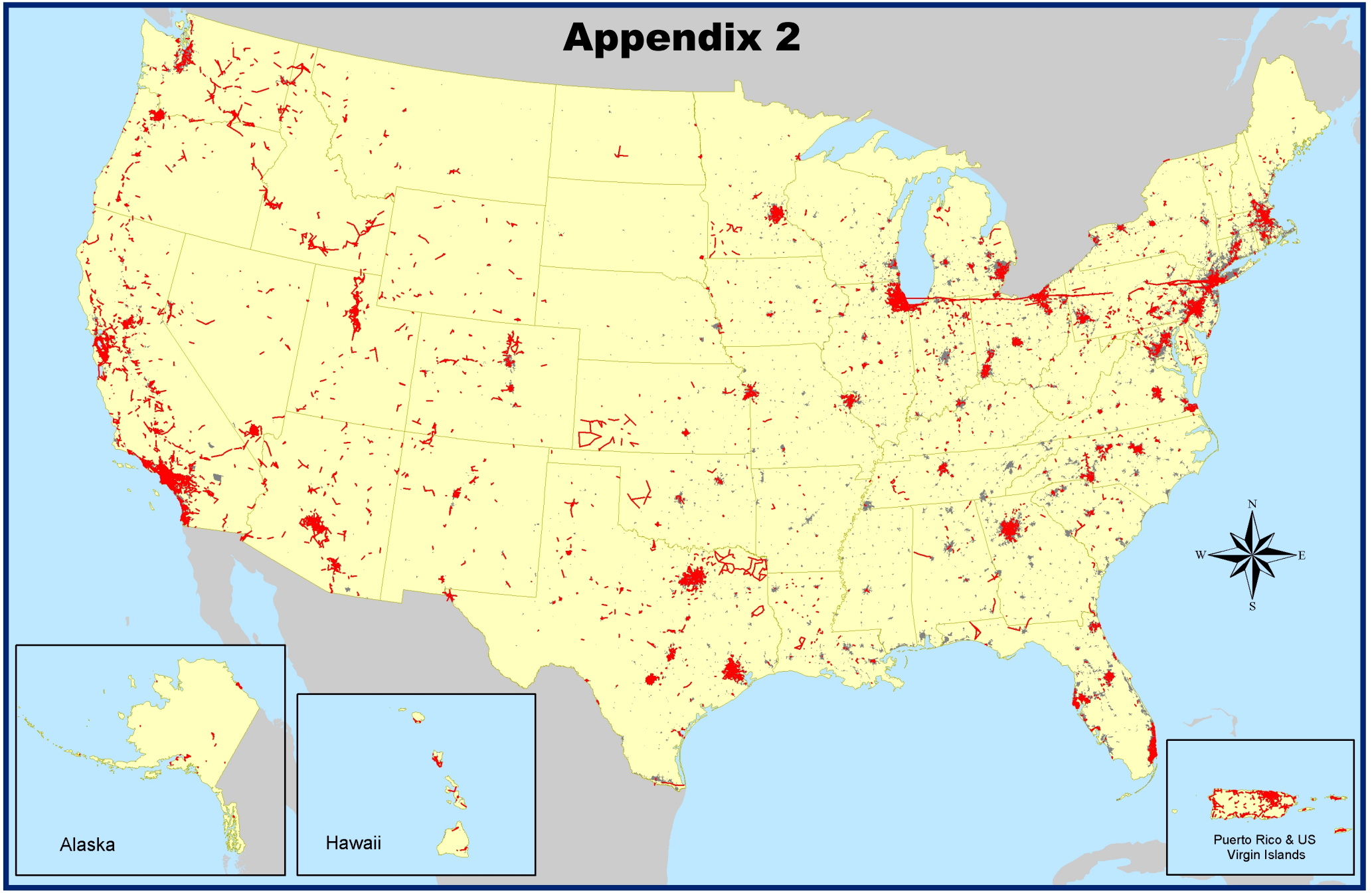
## 11 GHz Microwave Paths

**Legend**

Microwave Paths

Urban Areas

# Appendix 2

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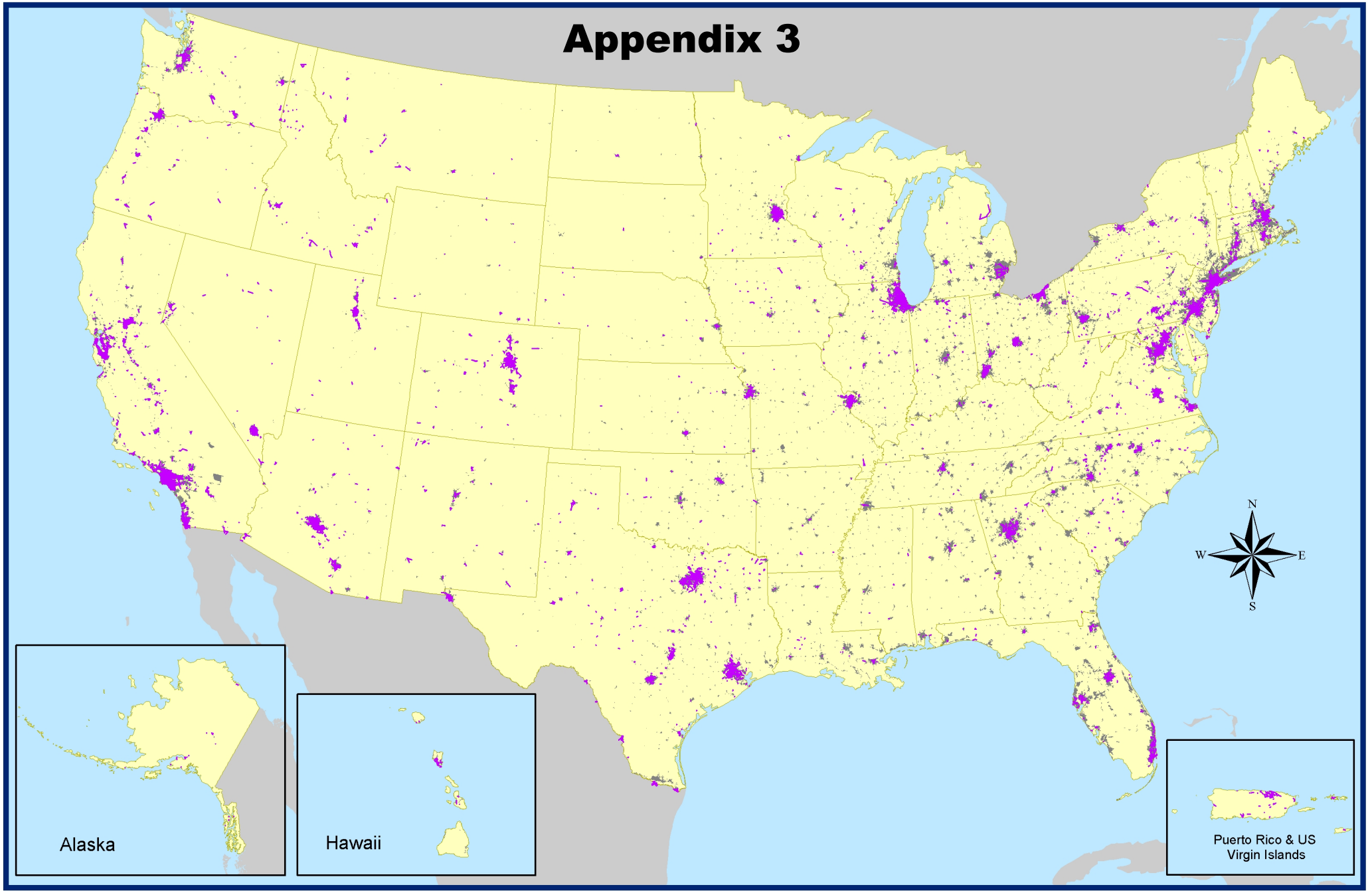
## 18 GHz Microwave Paths

**Legend**

Microwave Paths

Urban Areas

# Appendix 3

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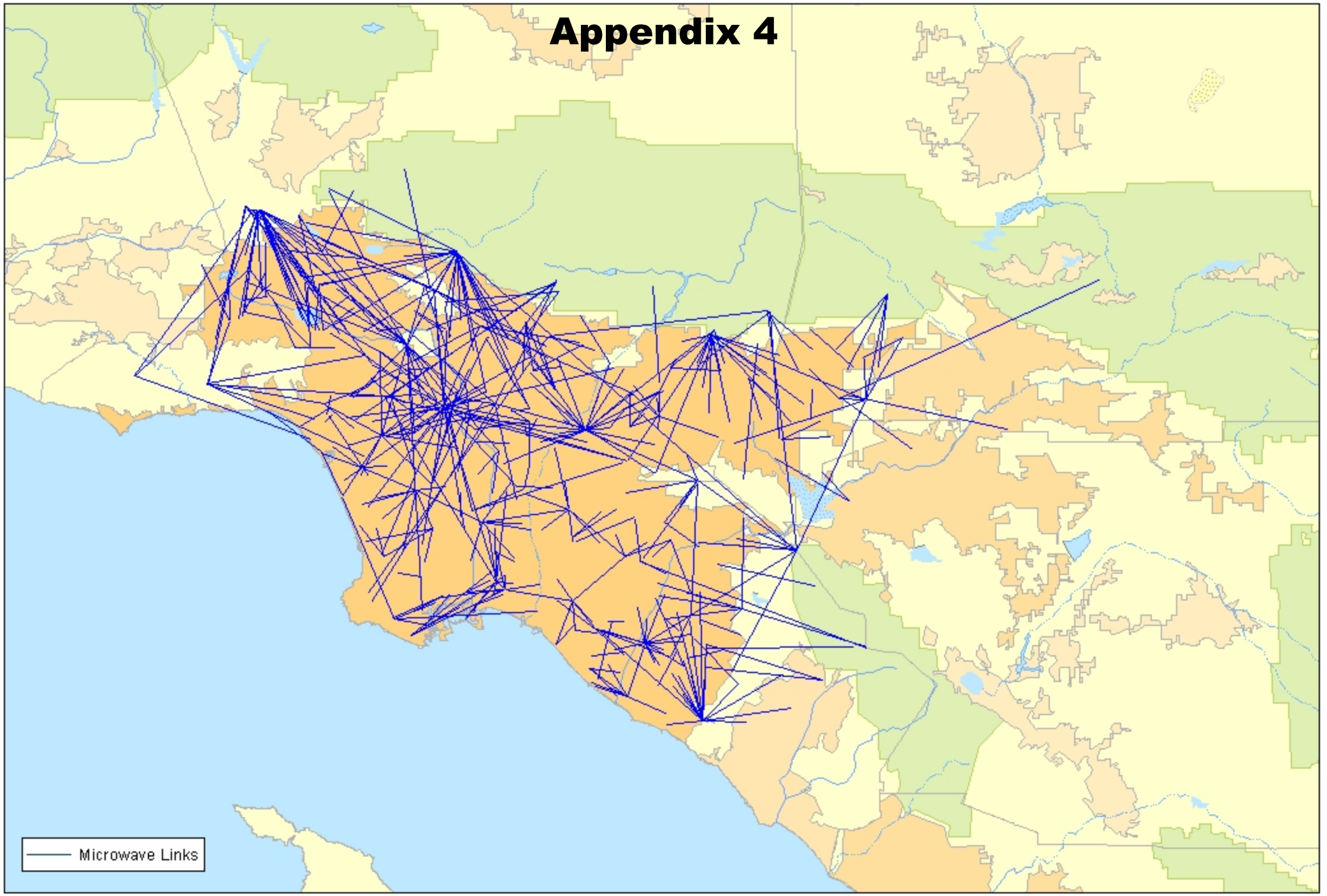
## 23 GHz Microwave Paths

**Legend**

Microwave Paths

Urban Areas

# Appendix 4




Los Angeles - 11 GHz

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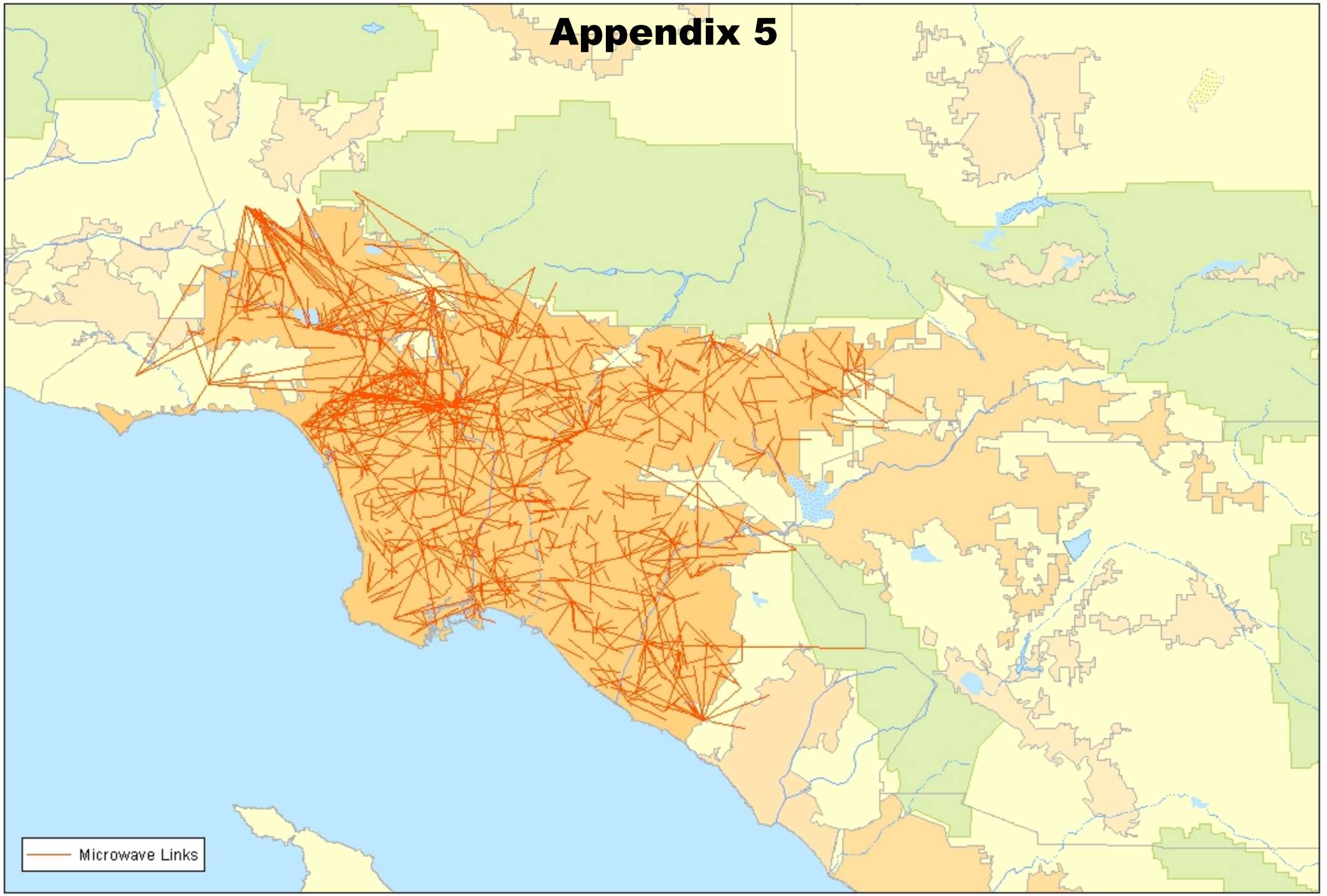
# Appendix 5

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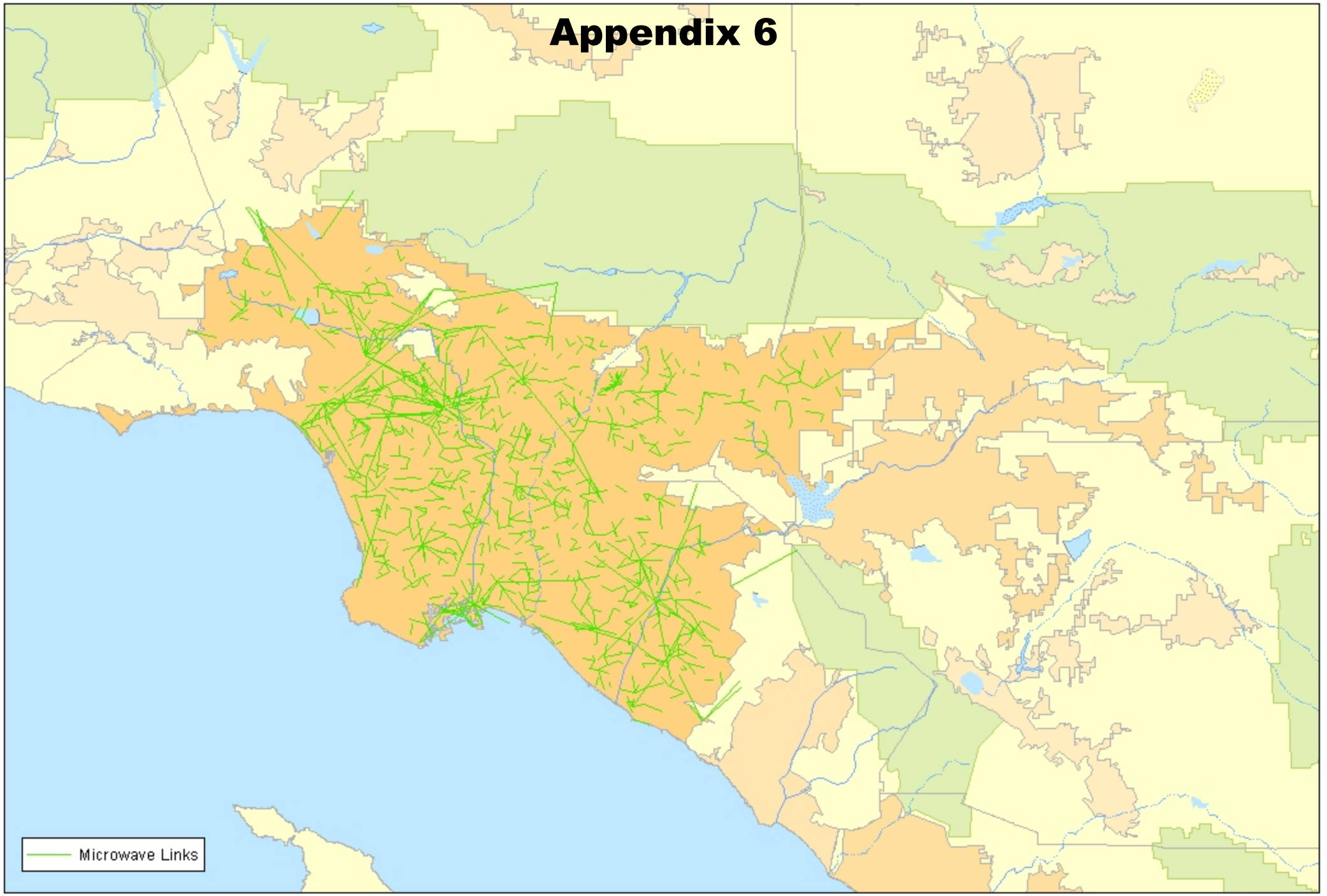
Los Angeles - 18 GHz

# Appendix 6




Los Angeles - 23 GHz

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